

ANNUAL REPORT

2020





INSPIRE. INNOVATE. INVEST.

ASME National Champions
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For more information or if you wish to share a story, please email us at CET_TODAY@UVU.EDU

Contributor and Graphic Designer: Rachael Freeman

Dean's Message



It gives me great pleasure to welcome readers, especially our friends and accomplished alumni, to this issue of the College of Engineering and Technology (CET) annual report.

Our motto for prospective students is *Engineer Your Future* to realize your goals and dreams and address our societal needs alongside. To be job-ready, the engineering, computer science, and technology graduates of the future must possess not only a good grasp of fundamentals, but must also be innovative, ethical, good team members, have good communication skills, and exhibit good understanding of global issues. Moreover, what sets CET apart from other engineering and technology programs is our hands-on, real-world approach to engineering and technology education, and encouraging our students to apply and test their practical knowledge against others in professional settings and competitions.

Despite the ongoing health and safety protocols due to COVID-19, in 2020, once again, the College of Engineering and Technology saw growth in the number of graduates and witnessed students participating in regional and national competitions and receiving numerous honors, including the first-place finish in the national competition sponsored by the American Society of Mechanical Engineers (ASME). Our Digital Media's web program earned the top ranking in the nation, and our civil engineering seniors worked closely with the Utah Department of Transportation on future expansion projects in the region. We saw the first graduating class of the three new engineering programs in civil, mechanical, and electrical disciplines to meet the growing demands for more engineers in the Utah Valley area. We believe the main reason for our success is our fostering of the close relationships that must exist among faculty, government, and industry partners to produce job-ready graduates.

This year, we continued to search for ways to inspire the new generation of engineers, computer scientists, and technologists. In close collaboration with UVU's School of Education and our colleagues at Utah State University, we introduced the Science with Engineering Education (SEEd) Pods to elementary school teachers who lacked confidence to take on engineering and technology-related activities. In February, world champion racer Sam Hornish Jr. visited our college and shared the message of teamwork, dedication, and character as core values for success.

It is well known that the number of high-tech companies in Utah has more than tripled since 2000 and, as a result, the demand for more engineers, computer scientists, and technologists along the Wasatch Front has increased significantly. CET is acting quickly to address that need. We have many students who want to major in engineering or computer science, and a new engineering building will allow us to increase capacity to accommodate this student demand and produce additional locally educated, qualified graduates to enter the workforce. A new engineering building will also allow the college to upgrade its infrastructure to take advantage of emerging technologies and pedagogies. We appreciate all the help that we can get to make our new engineering building a reality soon.

Please keep in touch and feel free to send me your ideas and thoughts on what you'd like to hear about in the future.

Saeed Moaveni

Saeed Moaveni, Ph.D., P.E.
Dean, College of Engineering & Technology
Professor of Mechanical Engineering
Utah Valley University

SEEd Pods

A SEEd Pod is a portable classroom/laboratory that provides K-12 students access to engineering and technology equipment.



Why SEEd Pods?

According to the National Center for Education Statistics, of the almost 2 million bachelor's degrees conferred in 2017, the number of degrees awarded in the fields of engineering was just 116,000.

"At a time when we need more engineering graduates to address our societal needs, only six percent of college graduates in the United States are engineering majors," Dean Moaveni said.

In an effort to get more K-12 students interested in pursuing engineering education, we have come up with SEEd Pods. These portable pods will house projects that will follow the Utah Science with Engineering Education (SEEd) standards.

This collaborative project – between UVU's School of Education, College of Science, and College of Engineering and Technology, USU's Emma Eccles Jones College of Education and Human Services and College of Engineering, and teachers and administrators from the local area schools – will bring together educators and experts from the engineering and education fields to promote interest in engineering in K-12 students.

According to Dean Vessela Ilieva and Dr. Krista Ruggles of UVU's School of Education, "Many K-12 teachers lack confidence to take on engineering and technology-related activities, and these pods along with the training that goes with each project, will alleviate the teachers' concerns."

Sponsors

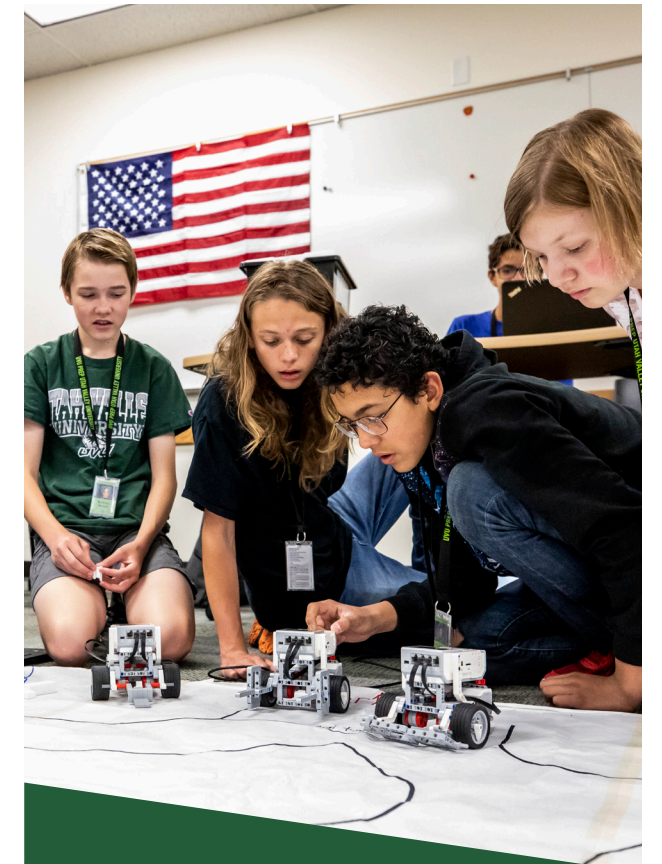
Thanks to the generous contributions of our sponsors, Facebook and Micron, we are currently preparing three SEEd Pods for rollout to local schools.



facebook

"Initially funded by UVU grants, SEEd Pods have also brought a number of industry sponsors helping with deployments at additional local schools in Utah County and schools with under-represented populations," Dr. Kazem Sohraby said.

Drs. Sohraby and Ruggles from UVU have been working closely with their USU collaborators, Drs. Kimberly Lott, Ning Fang, and Parker Fawson to develop pre- and post-assessment tools to measure the effectiveness of the SEEd Pods and incorporate improvements if and when necessary.



Become a sponsor

To learn more about sponsorship opportunities, please email us at CET_TODAY@UVU.EDU



Engineering & Technology Week

History of National Engineers Week

Since its creation in 1951, the National Society of Professional Engineers (NSPE) hosts a global event called Engineers Week each year in February. The purpose of the event is to encourage the next generation of engineers by providing opportunities for them to learn more and find their interest in engineering and technology. Engineers Week also focuses on increasing diversity within engineering. Universities across the world participate in the event by hosting events on their campuses.

For the past three years, CET, in collaboration with the School of Education at UVU has hosted Engineering & Technology Week. We invite local high school, middle school, junior high, and elementary school students to come explore their interests in the fields of engineering and technology. Students are given hands-on experiments and interactive activities that are designed to have them think like an engineer to solve problems.



To read more about Engineering & Technology Week 2021, please visit uvu.edu/cet/engtech-week/ or scan the QR code.

Record-Breaking Turnout

This year, more than 900 students from local schools attended Engineering & Technology Week, which is the largest turnout to date. Of the 900 students in attendance, many were girls. Engineering & Technology Week was founded on the principle of diversity, especially increasing the number of women in the industry. We believe that this reflects positively on the future of engineering, especially within our local industry.

Keynote Speaker

Mark Ripke, chief engineer at Boeing, addressed more than 300 middle and high school students as the keynote speaker. He shared his experience as a prominent figure in the industry and long-term engineer at Boeing. He encouraged students to work at pursuing careers in STEM from an early age.

Scholarships and Awards

Students from local high schools participated in the annual Engineering & Technology Week competition. The students were asked to design a project of their own choice to meet a current need in the STEM fields.

Makayla Lear of Grantsville High School and Benjamin Scott from Stansbury High School earned \$400 scholarships to UVU for their projects in bio-power and hydrostatic electricity, respectively.

Sponsorship Opportunities

Due to COVID-19, CET plans to host Engineering & Technology Week using virtual reality software in 2021. This software offers many new possibilities, but does come with associated costs.

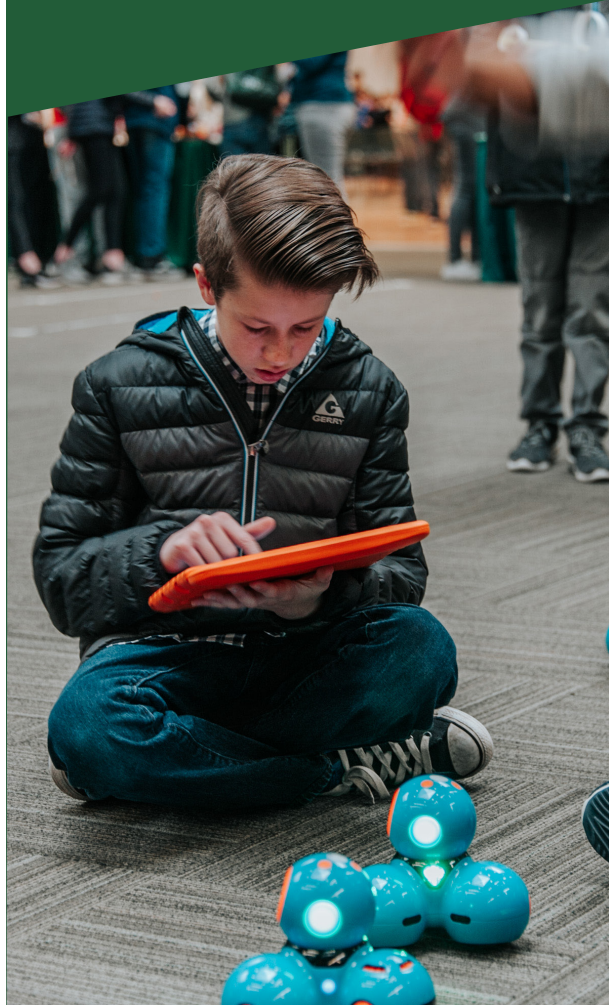
We are looking for sponsors to help us continue to inspire the next generation of engineers and technologists. If you are interested in learning more or making a donation, please email us at CET_TODAY@UVU.EDU.

“

Our goal is to prepare the next generation of engineers and technologists.

– Mark Ripke, Chief Engineer, Boeing

”



Motorola Solutions Foundation Grant



Professor Tom Hales of UVU’s Engineering Department has been awarded a \$45,000 Motorola Solutions Foundation Grant to host a PREngineer summer camp for 60 underrepresented high school students in grades 10-12.

The Motorola Solutions Foundation is a charitable and philanthropic organization within Motorola that seeks to give back and support the communities where it operates. Each year, the Motorola Solutions Foundation awards strategic grants that are highly sought-after and competitive. The grants are awarded on the basis of merit, innovation, and community outreach.

Tom Hales received \$45,000 from the foundation to fund an inclusive summer camp that fosters diversity in engineering and provides opportunities for under-represented populations. The summer camp is a collaboration with the UVU Latino Initiative and is specifically for women, minorities, and first-generation students – those students that are currently under-represented in engineering and technology.

The funds will sponsor a PREngineering camp entitled “Engineers of the Future.” The students will be given an opportunity to participate in a dynamic four-week program involving civil, mechanical, electrical, and computer engineering, and related fields of technology.

The PREngineer summer camp will leverage UVU and community resources to provide mentors, career role models, and engaging activities to help inspire these youth to pursue engineering and technology-related educational degrees and careers.

Because of this generous grant from Motorola, participants will be able to attend the PREngineering

summer program at no cost. Financial burden is a significant barrier for some individuals in under-represented demographics, as well as not having early exposure to engineering and technology education. Our goal is to inspire these students to visualize and pursue careers in STEM by breaking down pre-existing barriers to entry.

Although originally scheduled for summer 2020, the camp is postponed until 2021 due to COVID-19 restrictions. Motorola generously offered to roll over the funds for an additional year.



Our goal is to inspire students to visualize and pursue careers in STEM by breaking down barriers to entry. Funds from the Motorola Grant will sponsor an engineering summer camp for high school students from underrepresented populations. To learn more about the Motorola grant, scan the QR code.

Mechanical Engineering Students Win ASME National Competition

A team of UVU mechanical engineers was named best in the nation at the American Society of Mechanical Engineers (ASME) national competition this year.

At ASME, each team was tasked with designing and constructing a drone that could pick up a payload and deliver it safely to a designated location.

UVU teams flew into first place over teams from the University of Michigan (second place), North Carolina State University (third place), and Brigham Young University (fourth place). Competing Wolverines included mechanical engineering students Bryce Prestwich, Logan Sanford, Rodrigo Osorno, and Shawn Weeks.

“Some of the universities we went up against have well-established engineering programs, where with us we are just getting our first graduates this semester,” Sanford said. “We definitely came in as the underdogs.”

Knowing the caliber of the other schools competing, the team worked hard to perfect their drone within a limited time frame.



The winning drone is affectionately named Lucy.

“This is very exciting and rewarding,” said Dr. Masood Amin, Associate Professor of Mechanical Engineering at UVU. “It is the first national award received by a team from our new engineering programs at UVU. Knowing the quality of our students and programs, we expect more national champions in the near future.”

The winning drone design included lightweight 3D-printed components, two cameras for increased visibility, and specialized handles to ensure safe pickup and delivery of items. UVU students paid close attention to detail and designed a type of joint that minimizes damage and repair costs in the event of a crash.

The design of the drone evolved to become optimal at performing the tasks required by the competition, the team said. They also credited the drone’s ability to dive and land as a competitive advantage.

Earlier in the semester, the team filmed an entry video showcasing the drone’s abilities. The drone can be seen navigating obstacles with ease and readily performing the tasks required at the competition. The drone has a remote controller and headset for the pilot who could toggle between the two cameras on board the drone.

Amin had the opportunity to teach these students in several classes over their time in the mechanical engineering program at UVU. “They are very bright and talented. I know for sure they will be excellent engineers,” he said.

UVU offers degrees in civil, computer, electrical, and mechanical engineering and is currently raising funds for a new building to accommodate the needs of a growing number of students in our engineering programs.



Scan the QR code to watch the winning drone take flight.

“Some of the universities we went up against have well-established engineering programs. We definitely came in as underdogs.”

– Logan Sanford, Mechanical Engineering Student



Pictured (left to right): Bryce Prestwich, Logan Sanford, Rodrigo Osorno, Shawn Weeks

The Power of Mentoring First-Generation and Non-Traditional Students

Scott Newin grew up watching his parents work 12-hour days to provide for his family. He respected the sacrifice his parents made for him and soon adopted their strong work ethic. No one in his family had a college degree, and Scott hadn't considered pursuing one either, until he met Ron Mortimer from the board of directors at a local engineering firm, Horrocks.

At the time, Scott was working at a bank, as well as working part time on automotive repairs. During his time in the automotive industry he made several repairs on Ron's vehicles, and the two formed a professional relationship. Ron recognized Scott's potential and encouraged him to apply for an internship at Horrocks.

"Ron taught me that with my work ethic, skill, and problem-solving I was meant for more. He pushed me to see that there was another world working instead of with your hands but more mentally designing things. He helped me realize that you can have a family and

be a part of that family and still be able to provide for them. My dad would always say, 'Pick your career before it picks you.' Well, Ron gave me direction to pick the career I wanted. He gave me insight into what it was like to be an engineer, and he helped me in the rough times of school life and personal life," Scott Newin said.

Scott successfully interviewed for the internship at Horrocks, where he later decided to pursue a degree in civil engineering. He initially applied and was accepted to the civil engineering program at the University of Utah. It was around this time that he connected with UVU's Dean of the College of Engineering and Technology, Saeed Moaveni.

"Saeed helped me realize that the staff at UVU [was] more dedicated to the student's well-being than research, that the UVU program was going to show and teach students at a personal level. I felt this day one with the staff," Newin said.

Scott graduated from the civil engineering program in 2020, as a non-traditional and first-generation student. He credits his parents for the work ethic they installed in him through their example, and the support of Mortimer and Moaveni. He says that without this support, he never would have pursued a degree in civil engineering.



Scott Newin graduated with a B.S. in civil engineering as a first-generation and non-traditional student.



“
Ron taught me that with my work ethic, skill, and problem solving I was meant for more. Ron gave me direction to pick the career I wanted.”

– Scott Newin, Civil Engineering Graduate



Digital Media Department Share the Untold Stories of Namibian Women



A team of UVU Digital Media faculty and students worked on a project called “The Untold: Namibian Women’s Stories.” The team interviewed women from all 12 ethnic groups in Namibia, Africa, to hear the challenges and struggles in their own words. Often, the voices and stories of women in Namibia are overlooked. This project is the first comprehensive research done on Namibian women. The aim of the project was to record these untold stories and preserve them for future generations.

“They were grateful that someone cared enough to record their stories and experiences as part of this project,” Digital Media Professor Emily Hedrick said.

Digital Media Professor Michael Harper led the project initially. For the last two years, Professor Hedrick has taken the lead on it. She has traveled with two students to Namibia to record the stories. When the team first arrives at a village in Namibia, they are careful not to startle locals with the camera equipment. Before setting up the film and camera equipment, Hedrick first shares

a Polaroid with the women in the village. She snaps a photo and shows how the Polaroid develops from a blank white piece of film to a portrait of each woman.

“This caused ripple effects through the neighborhood, and soon we had a line of women and children wanting a picture for themselves too,” Hedrick said. “Something as simple as an instant film photo helped open doors and allow us to capture their stories.”

The final deliverable for the project is an immersive website called “The Untold Women’s Project.” UVU’s Namibian women’s project will be the first to launch. It will be an ongoing project to collect women’s stories from all over the world. The Digital Media team plans to launch the website during the spring 2022 semester.



“

If you have good character, you will go far.

Sam Hornish Jr., Indy 500 Champion

”

World Champion NASCAR and Indy-Car Racer Visits CET

At just 26 years of age, Sam Hornish Jr. had accomplished his lifelong dream – to win the Indianapolis 500, often called the Indy 500.

In February, world champion racer Sam Hornish Jr. visited our college. Hornish has 25 career wins to date, including the Indy 500 and three Indy Car Series championships. In 2006, he won the Indy 500 by just 6/100ths of a second, which was the second-closest in Indy history at the time.

The Indy 500 is a 500-mile race comprised of 200 laps around a circuit. Being eligible to compete in the race alone is a significant accomplishment.

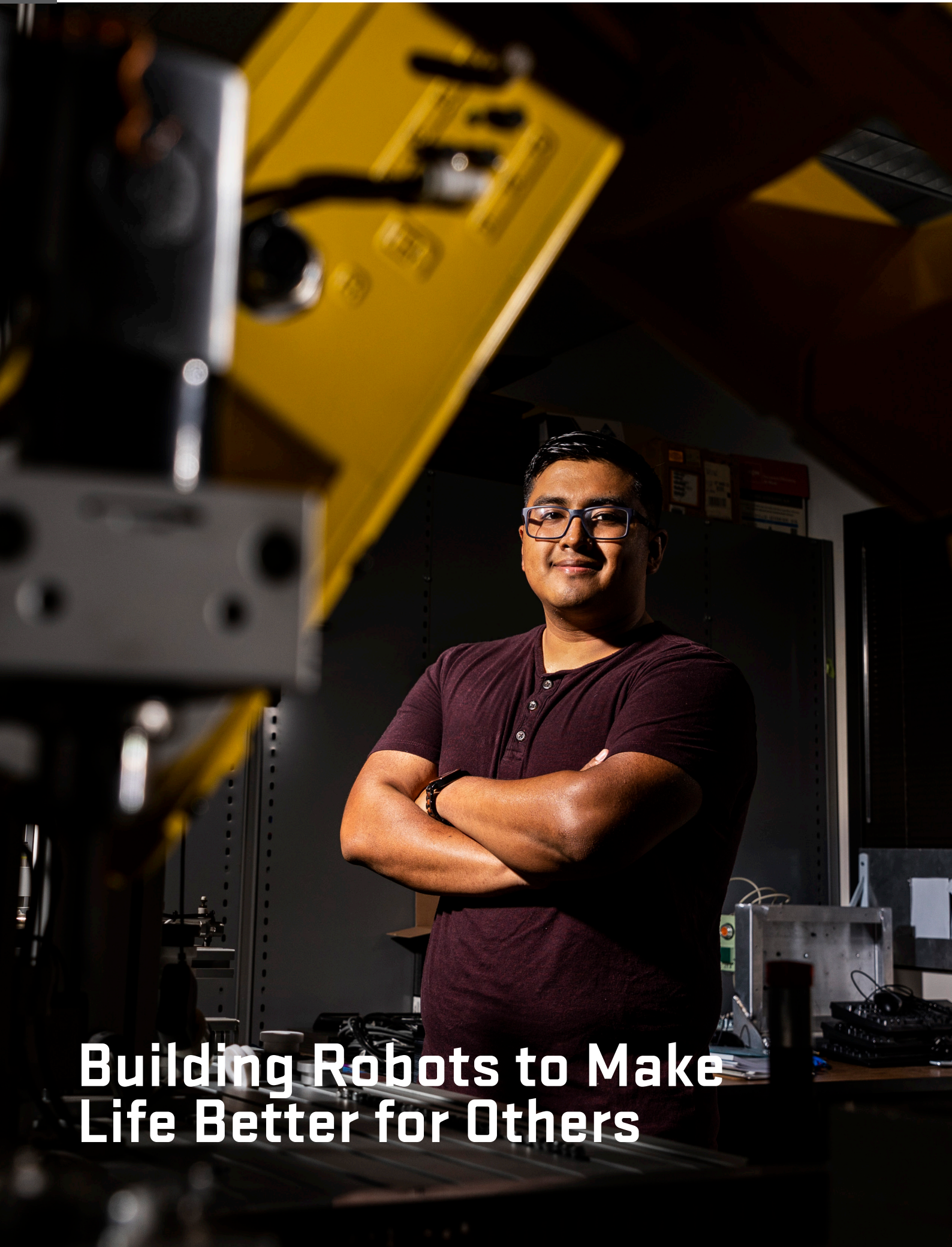
But he insists that his success comes as a result of teamwork. In professional racing, a crew is assembled to build and repair the car, fine-tune the engine, and monitor the driver's performance in great detail.

“Each person on the team plays an integral part,” Hornish said. “Everyone needs to work together and do their part to win the race.”

Hornish is a great inspiration to many, especially our transportation technologies students. He shared with them a message of teamwork, dedication, and character – core values to be successful in the automotive industry.

To read more about our visit with Sam Hornish Jr., scan the QR Code below.





Building Robots to Make
Life Better for Others

As a child growing up in Mexico City, Isaac Zamudio would sit in front of the television, watching episodes of “Dexter’s Laboratory.” He would think about complex machines that could solve problems. He knew instantaneously what he wanted to study when he grew up.

His passion, at times, felt like a dream. Neither of Zamudio’s parents finished high school, and he was the first person in his family to pursue a college degree.

When he saw how hands-on the Electrical Automation and Robotics Technology (EART) program was at Utah Valley University, he found a new home.

Zamudio will finish his Associate in Applied Science degree in robotics in December, 2020. Next, he wants to earn a bachelor’s degree in technology management, a goal he wouldn’t have thought to pursue if he hadn’t won the Victor L. Davies Scholarship for EART students.

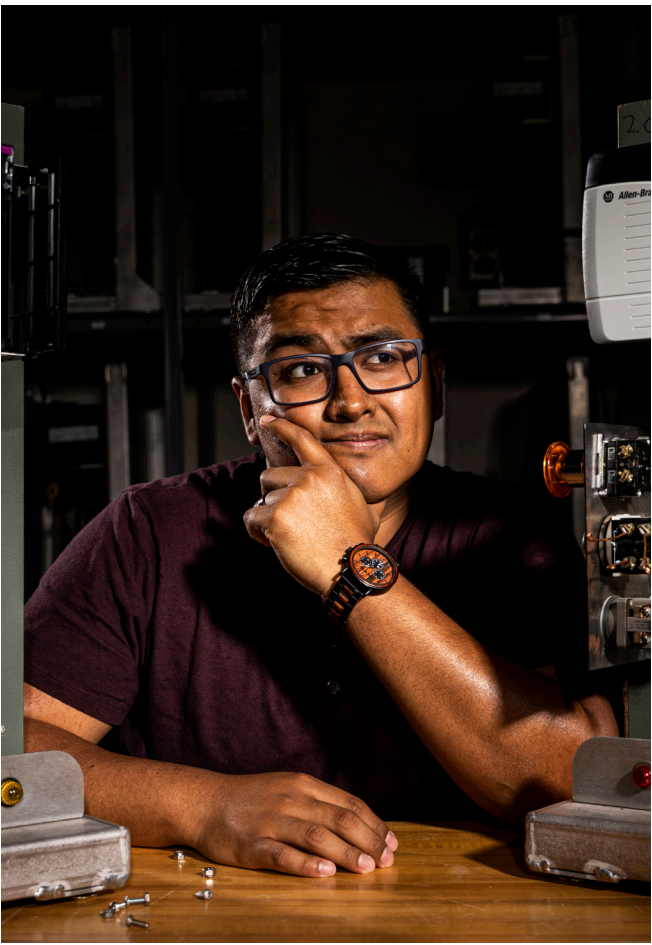
“This is my second year applying and receiving this scholarship,” he said. “When I saw the application the first time, I was so happy that UVU offered funding for my specific area and for students with a strong work ethic. The support of the donors has really made my academic goals attainable.”

In July 2019, his practical experience provided him with a chance to compete at the SkillsUSA National Championship. He and a partner won a gold medal in robotics and automation technology.

“When I started my education at UVU, I wasn’t expecting to win national competitions,” Zamudio said.

After he graduates, he hopes to enter the workforce in a role that will make a difference.

“I want to work for a company that will help the community,” he said. “I used to think that prosthetics would be the only way I could help people through robotics. But my education has opened my mind. Technology can help humanity in so many ways. I love finding solutions for all people.”



“

In Mexico City, we learned the concepts, but only from books. Here, we learn by actually building things and figuring out real-life problems.

Isaac Zamudio, Student, EART

”

Daily Herald

**This story was featured in the Daily Herald.*



National Science Foundation (NSF) Grants

NSF Funds \$400K Research Grant



Dr. Kazem Sohraby, Professor of Electrical Engineering and Associate Dean of student affairs is the Principal Investigator (PI) for the \$400,000 research grant from the National Science Foundation.

The College of Engineering and Technology was awarded a \$400,000 grant from the National Science Foundation (NSF). Dr. Kazem Sohraby, Professor of Electrical Engineering and Associate Dean of Student Affairs is the Principal Investigator (PI). The grant allocated \$140,000 for scholarships to students whose interest is in undergraduate research in the general area of wireless and sensors networks. This will mostly apply to UVU students in electrical engineering, computer engineering, computer science, and mechanical engineering. The duration of the scholarship is three years, with \$50,000 allocated for the first

year and \$45,000 each for the second and third years. The remaining funds will be allocated to graduate students research. The title of the project is “Non-Orthogonal Multiple Access Pricing for Wireless Multi-media Communications.” The outcome of the project is expected to advance the discovery of new frontiers in wireless communication techniques. The project is a collaboration between undergraduates at UVU and students, both graduate and undergraduate, at San Diego State University.

NSF S-STEM Grant

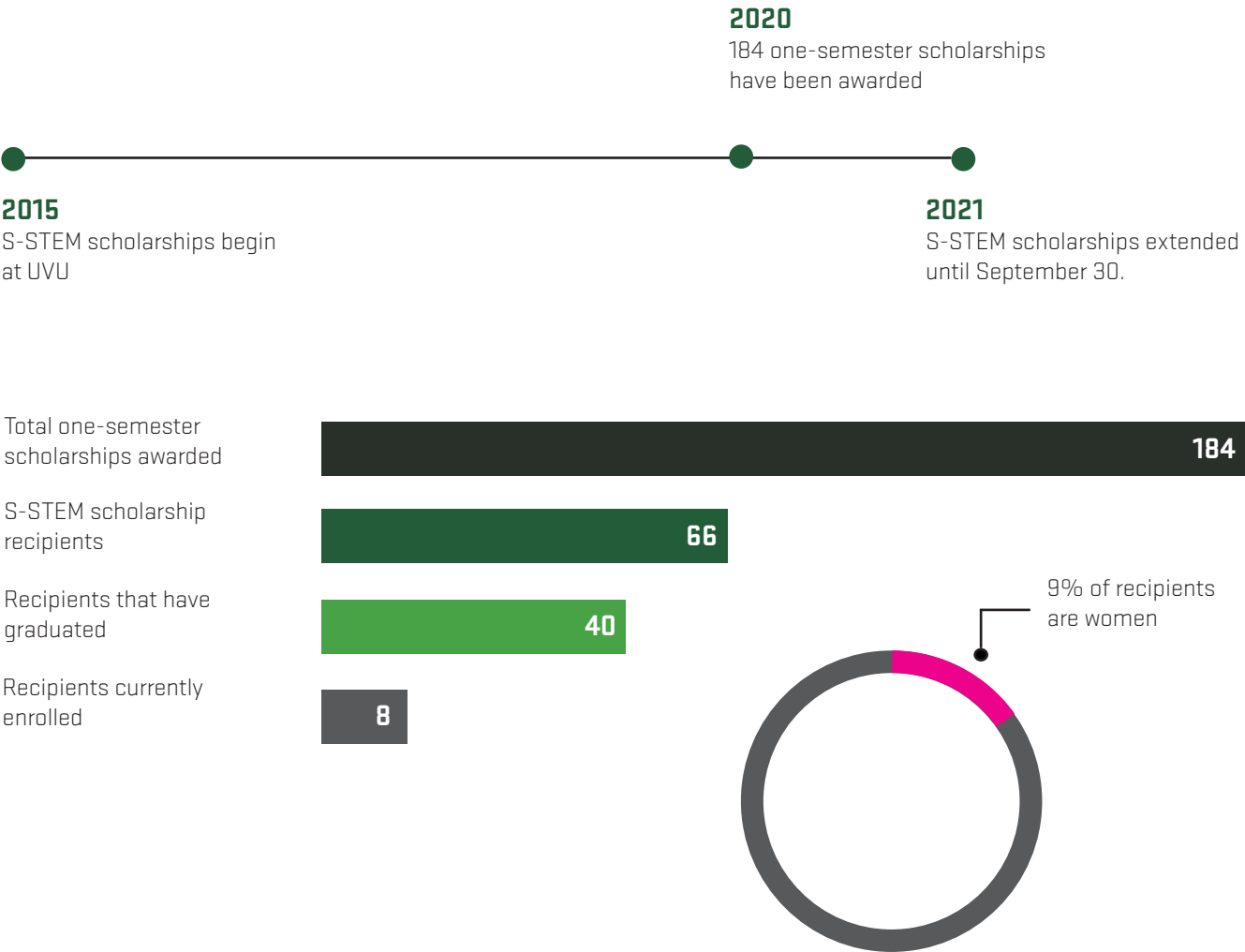


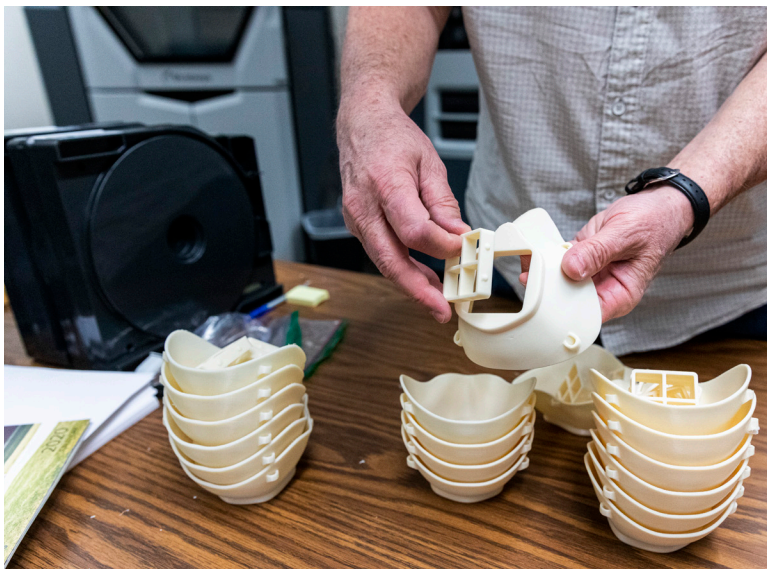
Dr. Afsaneh Minaie, Engineering Department Chair, oversees the National Science Foundation S-STEM grants for CET. To date, \$617,396 in scholarships have been given to students.

In 2020, the National Science Foundation funded grants for the College of Engineering and Technology as part of its Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM) Program. The purpose of the program is to increase the number of high-quality STEM professionals in the workforce, and increase the success of low-income, academically

talented students. This is the sixth year that CET has been the recipient of S-STEM funding. The project was granted a 1-year extension and will end on September 30, 2021.

S-STEM Statistics





Distribution of free masks on UVU campus

Our Response to COVID-19

The onset of COVID-19 brought about many unique challenges in 2020. The College of Engineering and Technology responded quickly and proactively. Our priority is ensuring the health and safety of our students, faculty, staff, and community. Our efforts to date have been driven by our belief that we are leaders in innovating change, especially within our local community, and that we have a responsibility to the well-being and safety of our students, faculty, staff, and their families.

Timeline of Our Response



THE BIG PICTURE

COVID-19 reminded us of the important roles computer scientists, engineers, and technologists play in our lives, in addressing unexpected issues that arise during unforeseen global events. We have many students who want to major in engineering, computer science, or technology, and the new engineering building will allow us to increase capacity to accommodate this student demand and produce additional locally educated, and qualified graduates when these and other unforeseen issues arise.

3D Printed Masks For COVID-19 First Responders

In January 2020, the first cases of COVID-19 were confirmed in the U.S. During this initial phase of response, the sudden demand for masks and personal protective equipment for the general public made it difficult for first responders to have access to the equipment they needed.

Utah Valley University participated in a widespread initiative designed to help meet the needs of COVID-19 first responders by 3D printing masks that could be worn by medical professionals and those on the front lines of the COVID-19 pandemic. UVU was joined by other Utah universities and organizations to produce more than 900 masks.

Sid Smith, Associate Professor of Architecture and Engineering Design, worked on producing the masks using the prototyping lab at UVU. The printing process took about 16 hours to produce up to 6 masks. Although time-consuming, it was a relatively easy process, according to Smith.

He downloaded a file with the design for the masks. The file then processed using software in the lab. Smith arranged the needed materials on a pallet and sent it to the 3D printer. He then left the printer overnight and returned the next day to six freshly printed sets of masks, repeating the process each day.

While many of the masks stayed within the local community, some would be distributed nationally, or even internationally, to supplement the shortage of traditional masks at the time.

According to Provo Police Dispatch, there were approximately 550 officers serving Utah County residents and numerous other first responders in need of masks at the time that benefited from the 3D printed masks.

“We’ve had contributions from the College of Engineering and Technology and the community to help us with this effort,” Smith said. “Everyone is coming together to help our first responders in any way we can.”

“This isn’t the first time we’ve offered our prototyping resources to help the community,” Smith said. “But this is the first project of its kind, where we’re being asked to help on a large scale.”

To learn more about CET’s response to printing masks, please visit our website: uvu.edu/cet/blog/masks.html.

“

We received an astonishing number of 3D printed masks. We have received enough for Provo Police Department and Provo Fire, as well as all the police officers in Utah County.”

Provo Police Department, April 2020

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**This article was featured by the Associated Press, U.S. News and World Report, The Salt Lake Tribune, and Daily Herald.*



Sid Smith, Associate Professor, Architecture and Engineering Design





Digital Media Web Design Program Earns Top Ranking

UVU was named the top institution of higher education for “the new generation of web designers,” according to a recent ranking published by College Magazine.

“We know Utah for its spectacular state parks, and now we can remember it for clinching an accolade in the web design world as well,” College Magazine’s Sarah Bogaards wrote. “Working in interactive fields like UX [user experience], design, or development means constantly collaborating with colleagues who have both similar and different specialties. [...] UVU students can count on opportunities to go beyond borders to expand their professional horizons.”

The ranking highlighted UVU’s engaged-learning approach, including classrooms that simulate home and consumer technology environments and the Advanced Digital Media Sandbox on campus.

College Magazine quoted UVU Digital Media student Kevin Acosta, who mentioned the varied and innovative methods UVU’s education offers. “From the very beginning [to] the end, students are molded in a way of thinking outside the box,” Acosta said.

UVU beat out schools like Drexel University, Washington & Jefferson College, Santa Clara University, DePaul University, and Purdue University to take the top spot in College Magazine’s rankings.

“We have a lot of advantages at UVU compared to other universities,” said UVU Assistant Professor Emily Hedrick. “The first is we have a faculty team that’s encouraging to each other. The students are excited and invested to develop ideas and do projects. We also have an amazing department chair in Kim Brown and dean in Saeed Moaveni, who are supportive of how we are developing the program. Then we add UVU’s emphasis on engaged learning into the mix, and it really is an environment where we can bring out the best.”



To read the full article in College Magazine, scan the QR code.

Changing Times in Computer Science

A Growing Need

Software is fueling revolutionary breakthroughs in almost every aspect of our lives, including health care, personal safety, the environment, transportation, and shopping. Every year new technology is being imagined, built, and launched. This development is taking place at such a rapid pace that it is fueling an unprecedented increase in demand for skilled computer science professionals.

Utah's Silicon Slopes is an important player in the software world. Large global companies have noticed the rich talent pool in Utah. Because of this, many are opening research and development centers in the region. Innovative startups are exploring ways software can benefit the world. Thousands of new software workers are needed to augment the area's vibrant economy.

The Computer Science Department at UVU is a key

player in educating the regional workforce and providing the technical foundation for these computer software professionals. With over 250 collective years of industry experience, in addition to classroom tenure, our faculty members have unique expertise in practical software development and applications. By partnering with practical and theoretical experience, UVU has set itself apart from many higher education institutions.

Working to Fill The Gap

In the last 15 years, the Computer Science Department has undergone significant changes to adapt to the needs of the industry, and to keep up with new technological developments. At least 19 of our courses have undergone or are currently undergoing complete redevelopment. We have also added at least 20 new courses, with at least 6 new courses planned. Additionally, we added three new programs, with two more pending approval – one is a new specialization, three are new bachelor's degrees, and one is a master's degree.

According to Computer Science Department Chair, Dr. Neil Harrison, this shows how we are adapting to the rapid development of the computer science and software industry, and demonstrates the innovative response we have taken as a university and college.

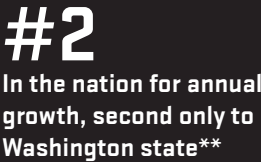
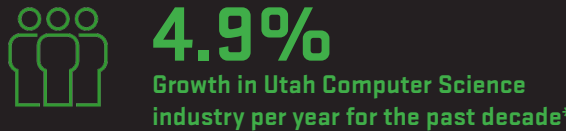
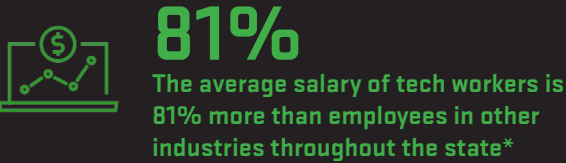
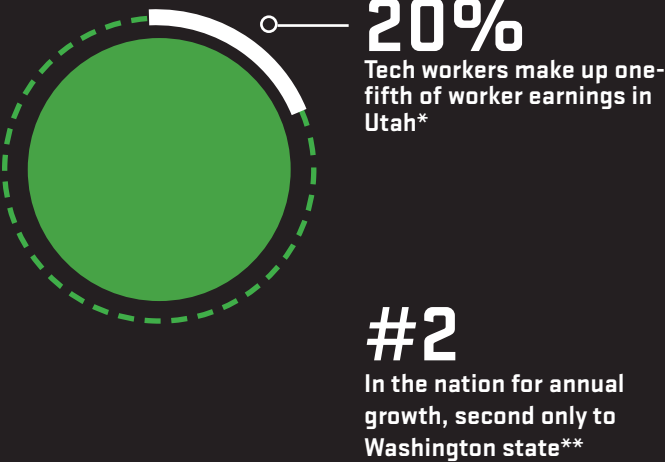
The UVU Computer Science Department is dedicated to providing programs and degrees that prepare our graduates for the industry. We work closely with the local tech industry and are the closest university to what has become known as Silicon Slopes. As we look to the future, we are adapting to make innovative changes that will benefit our students and the industry as a whole.

The essence of computer science is solving problems. Its application is changing every aspect of our lives from how we learn, address global issues, improve essential individual and community services and interact with each other worldwide. The application of computer science is also largely responsible for much of the wage growth in our economy. Yet there is a growing gap in Utah between the number of job openings and the number of qualified graduates.

This gap keeps growing, and we are asking for your help closing it. We are currently raising funds for scholarships and endowments for computer science students. Additional funding is needed to ensure we provide engaging learning experiences, and stay up-to-date with industry advances. To fill the gap, we also need to have space for the growing number of interested students in computer science, hence the need for a new engineering building.



Dr. Neil Harrison
Computer Science Department Chair



*Source: The Utah Department of Workforce Services (2018, projected data)
**Source: Kern C. Gardner Policy Institute (2019)



531K Projected number of new jobs in computer science in the U.S. by 2029*



20 New courses added to UVU's Computer Science Department



63% Increase of CS student graduations over the last five years**

• Source: U.S. Bureau of Labor Statistics projected data (2019-2029)
•• Source: UVU Institutional Research (2020)

Graduation 2020

In August, Utah Valley University celebrated the graduating class of 2020 by hosting a drive-thru, socially distant Commencement and Convocation service. In response to COVID-19, we needed to be innovative in our approach as we found a way of honoring the achievements of 6,410 graduates from UVU's Class of 2020. Many of our students celebrated with their families and loved ones.

Adhering to social-distancing guidelines and other precautions, graduates exited their vehicles one at a time, stepping onto a Wolverine-green carpet in front of a UVU backdrop to receive their diplomas from their deans while their names were read over a loudspeaker. Families and friends cheered from the cars as their graduates celebrated with their degrees in hand.

Gail Miller, owner of the Larry H. Miller Group of Companies and chair of the Board of Directors of the Larry H. Miller Management Corporation, addressed the graduates as this year's Commencement keynote speaker and honorary degree recipient. Miller told graduates that their lives are educational journeys. "We're listening and learning about social justice and the opportunity to create needed change," she said. "It's important that you continue to listen, to question, to learn, and then, to act." She said everyone should learn something new every day, and to teach others what they know, to make the world a better place. "Be a student, be a teacher, be a leader!"



Gail Miller (center) addressed graduates as the keynote speaker. She was also hooded as an honorary graduate.



First Graduating Class from New Engineering Programs

In 2020, we celebrated the first graduating class from our newly established engineering programs. A total of 21 graduates from civil engineering, mechanical engineering, and electrical engineering officially graduated in May, and were honored with a graduation service in August. This is a landmark accomplishment for our Engineering Department, and the number of graduates are projected to increase significantly in the coming years.

Since its creation in 2018, the newly formed Engineering Department has become an established part of our college. With nearly 900 students, the Engineering Department is experiencing rapid growth and has quickly become the second-largest department in our college. This rapid growth could not have come at a better time, as opportunities for employment are booming within engineering fields. The U.S. Bureau of Labor Statistics estimates that the engineering industry is growing 4-8% each year.

UVU's engineering programs are specifically designed to prepare graduates with professional experience, internships, and hands-on learning that will qualify them for a smooth transition into the workforce. This focus on hands-on, experiential learning is something that many engineering students and graduates value throughout their careers, and especially as they start out in the industry.

"I studied civil engineering at UVU because it felt like each professor was personally invested in my success,"

Civil Engineering graduate Julie Hansen said (pictured on the right). "The small class sizes really helped me to be able to work closely with professors to make sure that I understood the material in a way that prepared me for the professional field."

Hansen accepted a position with Jacobs Engineering Group in Taylorsville, Utah. During her time in the civil engineering program, she led the UVU chapter of the American Society of Civil Engineers. She is one of many graduates making an immediate contribution to our local engineering industry.

Our next steps are to obtain ABET accreditation, a process which is currently underway, and work toward funding a new engineering building. This innovative building will be the first "smart building" on UVU campus and will be a landmark for engineers and higher education facilities across the nation. We also plan to introduce complimentary program options that will serve our student's interests and industry needs.

For now, we celebrate the success of our graduates and their achievements. We look to the future with great hope for our trajectory and how it will help fill the needs of local engineering companies. We also know there will be many more successes and victories in the future.

We invite you to follow our story by visiting our website, uvu.edu/cet/.

Civil Engineering Graduate, Julie Hansen



Important dates and accomplishments

1

New Engineering Department

In 2018, we introduced three new engineering programs – civil, electrical, and mechanical engineering. We also formed the Engineering Department – UVU's newest department.

2

Rapid Growth & Achievement

Over the next two years, the newly formed Engineering Department grew rapidly, mirroring the local industry. Engineering soon became our second-largest department in the college.

3

First Graduating Class

In 2020, we honored the first graduating class from our new engineering programs. We celebrated graduates who are job-ready, and prepared to make an immediate positive impact in our local industry.

4

Future Planning & Projections

We are currently awaiting ABET accreditation visits for civil, mechanical, and electrical engineering. We are also raising funds for a new engineering building.

First Annual i-ETC Conference

In 2020, Utah Valley University hosted the first annual Intermountain Engineering, Technology, and Computing (i-ETC) Conference. The event was organized in partnership with universities throughout the state and made possible by educational contributions and sponsorship. The event included participants from eight countries, and the U.S.

The conference was originally scheduled for May 4-5, 2020, but was postponed until October to allow for COVID-19 safety precautions. Although originally intended to be an in-person event, the event was hosted virtually on October 2 and 3.

The i-ETC was founded in 2019 by the College of Engineering and Technology at UVU. It was a successful virtual event that attracted many authors and audiences from academia and industry. The conference included two keynotes, five invited talks, two virtual networking sessions, 100 paper presentations (from eight countries and U.S.), 14 capstone posters, and two tutorials.

Over the two-day conference, 780 total attendees participated virtually using Microsoft Teams. We hosted 33 events and sessions and awarded 15 student awards for research papers or posters.

Dr. Mohammad A.S. Masoum, an Associate Professor of Electrical Engineering at UVU, was the general chair of the i-ETC Conference in 2020. Thanks to the innovative efforts of Masoum and Dan Hatch, Professor of Digital Media, and other event organizers, the transition from a face-to-face conference to a virtual environment was successful.

“On behalf of the College of Engineering and Technology, I wish to thank all the organizers from UVU, USU, BYU, Weber State, University of Utah, and IEEE for their excellent work,” said Dean Moaveni. “Particularly, I wish to extend our gratitude to Mohammad Masoum, Dan Hatch, Kazem Sohraby, Ehsan Rohani, Stefan Harlan, all from UVU; Stephen Schultz from BYU; John Edwards and Rose Hu from USU; and Chad Kidder and Shanker Shrestha from IEEE.”

“There were many people who contributed to the success of the conference,” Dean Moaveni said. “Please visit the archive section of our conference website uvu.edu/cet/i-etc/ to see the complete list of the organizers and their effective roles. To all participants, thank you for bringing new ideas and starting new conversations about how to best educate our students to meet the workforce need of the future. This conference was not meant to be a single event, but a starting point for bringing people together each year to share innovative ideas and to have fresh conversations.”

The i-ETC Conference will be an annual event, with the next i-ETC Conference scheduled for October 2021 here at UVU. Dr. Neil Harrison, Chair of the Computer Science Department will serve as the next general chair for the conference. More information about event registration and sponsorship will become available on our website in 2021.

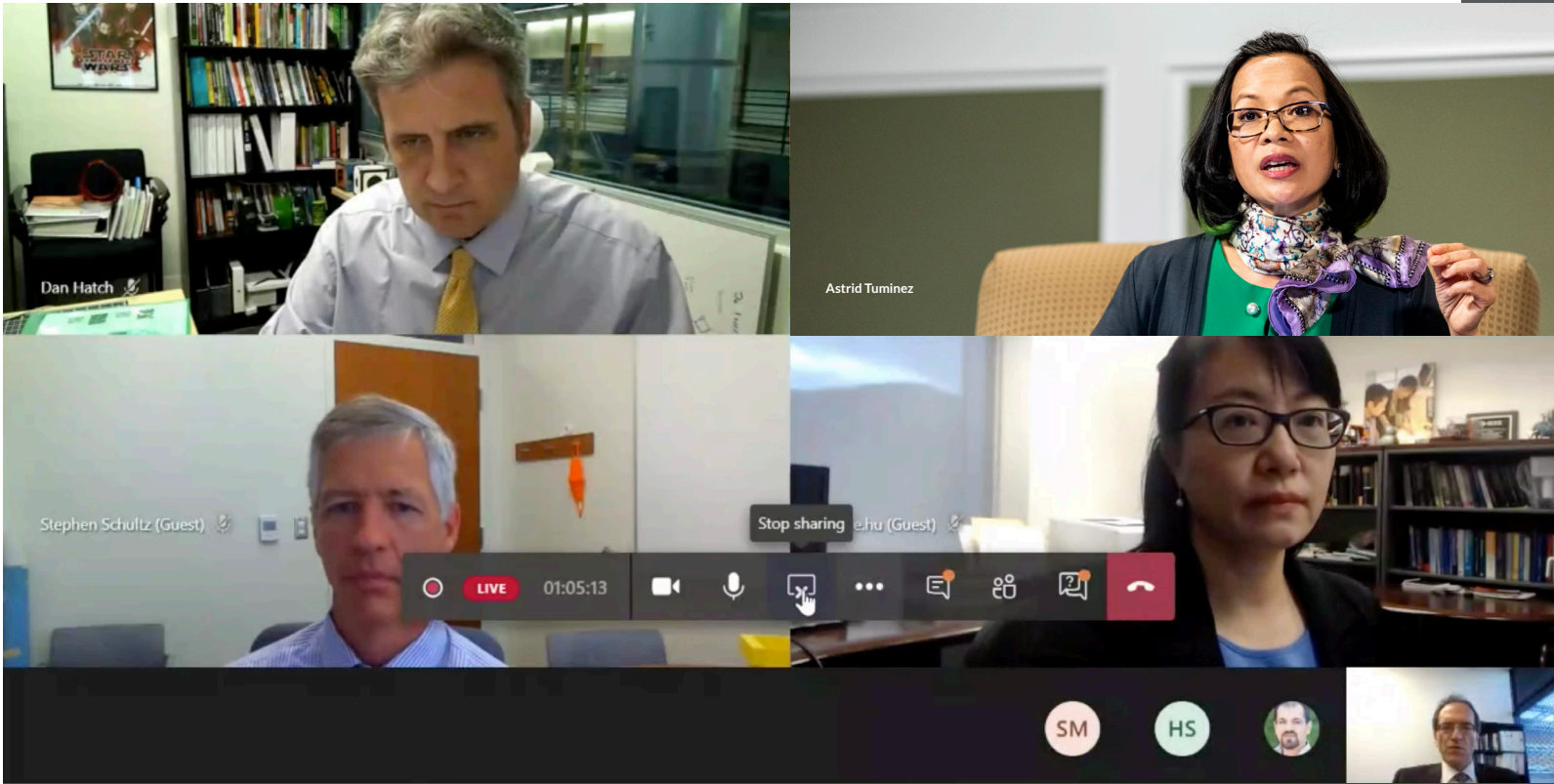
Keynote Speakers



Adam Robertson
Co-Founder and CTO of Fortem Technologies
“Drones that Hunt Drones with AI at the Edge”



Hamid Sharif
IEEE Fellow and Professor at The University of Nebraska, USA
“Wireless Communications for High-Speed Trains in U.S.”



Pictured above: i-ETC Conference participants, including President Astrid S. Tuminez in the top right, joined via Microsoft Teams. The event featured presentations and a live Q&A for attendees.

Thank you to our sponsors



UVU Named One of the Top Three Universities in the Nation for Return on Investment

Business Insider, an American financial and business news website, ranked Utah Valley University (UVU) third in the nation for the best return on investment.

The website produced this ranking from a list of four-year, bachelor’s degree-granting colleges and universities across the country, made available by the Department of Education. Not only did UVU make it into the top 24, Business Insider placed the university in slot No. 3.

“Students who attend school at UVU can count on an affordable, quality education and a significant return on their education,” said President Astrid S. Tuminez. “Business Insider’s No. 3 ranking is evidence of UVU’s commitment to maintaining affordability and accessibility to students, especially to those from traditionally underrepresented groups in the university’s service region.”

Business Insider determines the return on investment by a ratio of earnings to the average cost of attendance. According to the ranking, UVU’s return on investment is 84.7%. The average UVU undergraduate earns \$43,800 within 10 years of graduating, and the average annual cost to attend the school is \$12,921. Earnings for new engineering and technology graduates are significantly higher.

As the only public university in Utah to be ranked by Business Insider, UVU prepares students to find employment in what the Utah Department of Workforce

Services calls well-compensated, four-and-five-star jobs, including in mechatronics, robotic technologies, and electrical automation. In addition, the length of UVU’s economic impact has proven itself over time, with 85% of UVU students living in Utah a year after graduation and 76% living in Utah 10 years after graduation.

UVU is the largest institution by head count in the Utah System of Higher Education and recorded its largest graduating class in school history with 6,410 graduates in 2020. It is the 14th largest employer in Utah and third largest employer in Utah County, serving as a state and regional economic engine that pumps money into the economy with a solid 8:1 return on investment – every tax dollar invested in UVU has an \$8 impact on the local economy.



BUSINESS INSIDER

**This story was featured in Business Insider.*

Alumni Success



Computer Engineering alum, Jacob Morris and his wife Kaitlin

“

I use what I learned in school every day. It has been invaluable to me.

Jacob Morris, Computer Engineering Alum

”

Jacob Morris graduated with his bachelor’s degree in Computer Engineering from UVU in May 2018. Morris earned his degree in just three years. To achieve this, he completed three semesters each academic year. Looking back at his time at UVU, he recalls the students and professors that supported him on his educational journey.

“Everyone in the program knew each other and there was a lot of morale and educational support throughout that group. Also, the teachers were phenomenal and were always available to help students,” he said.

Upon graduating, Morris accepted a position with Blue Raven Solar as a PV Engineer for almost a year. He applied the hands-on learning he received from UVU to his professional job, and quickly noticed the real-world applications of his degree.

“I work a ton with electronics, schematics, circuitry and hardware and use what I learned in school every day,” he said. “It has been invaluable to me.”

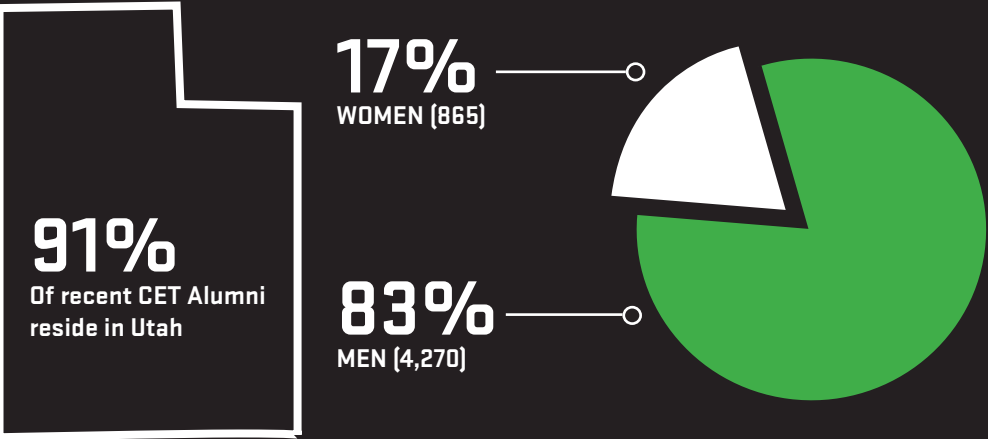
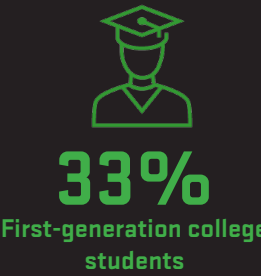
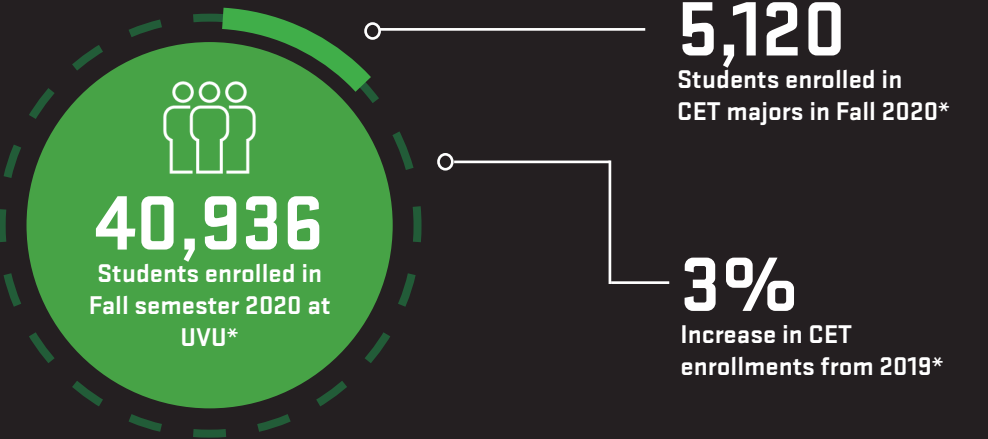
He now works as a Test Engineer at Inovar, Inc – an electronic manufacturing service provider in Logan, Utah. Morris was selected from a wide range of candidates for his position and was ultimately successful due to his high-quality education and professional experience. To date, he has worked with Inovar, Inc for almost two years.

“I would not have gotten my current position without my degree – hands down. I was selected from a wide range of candidates because I had the education and background to fulfill the role and requirements,” Morris said.

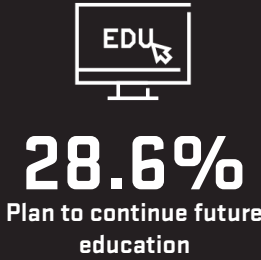
Morris plans to stay in Utah and contribute to the local computer engineering industry, with the goal of one day designing and building his own hardware and project ideas.

CET By The Numbers 2020

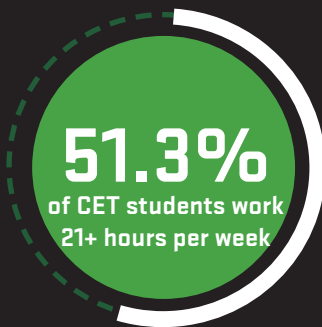
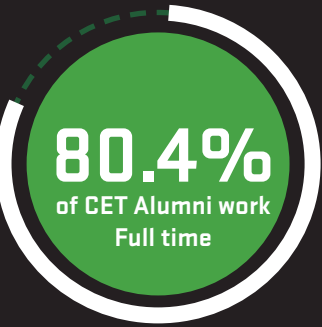
CET STUDENTS



95.7%
of recent CET alumni had an *excellent* (48.6%) or *good* (47.1%) experience at UVU



CET ALUMNI & STUDENT EMPLOYMENT



Source: UVU Institutional Research (2019-2020 data)
*Source: UVU Institutional Research (Fall 2020 data)

Scholarships & Endowments

Thanks to our generous donors, the College of Engineering and Technology awarded 146 scholarships during the 2020-21 academic year.

Scholarships

Blue Stakes of Utah Annual Scholarship Fund
UVU College of Engineering and Technology Scholarship
The Deseret Digital Media Annual Scholarship Fund
Granite Construction Scholarship
Horrocks Engineers Scholarship
Information Systems and Technology Annual Scholarship
InsideSales.com Scholarship Fund
Ivory Futures Building Dreams Scholarship
Jack and Mary Louis Wheatley Annual Scholarship
Richard and Zepha Boggess Scholarship Fund
Skills USA
Varvel Culinary Engaged Learning Fund
Engineering & Technology Week Challenge Annual Scholarship
College of Engineering and Technology Dean's Discretionary Fund
Dean's Merit

Endowments

Auto Expo Scholarship
The Beaver's Heavy Construction Endowed Scholarship
The Carrol Reid Memorial Endowed Scholarship
Culinary Arts Institute Endowed Scholarship
The Culinary Crafts Endowed Scholarship for Culinary Arts
The David. W. Johnson Family Endowed Scholarship Fund
George F. and Lilly W. Pearson Trust Scholarship Fund
The Geneva Recreation Association Building Construction Management Fund
Henry and Jean Davis Endowed Scholarship Fund
Keith R. Mulbery Endowed Scholarship for Information Systems
Mike Crouch Memorial Endowment Scholarship
Miles and Mary Morris Automotive Endowed Scholarship
Nestle USA Endowed Scholarship for Engaged Learning
Nu Skin Force for Good Foundation Endowed Scholarship
Paul Blaine Clyde Endowed Scholarship Fund
Saitama Auto Diesel Endowed Scholarship
The W. Cornell and Edna T. Clyde Memorial Scholarship
Universal Industrial Sales, Inc., Endowed Scholarship Fund
Utah Valley Home Builders Association Endowed Scholarship Fund
Victor L. Davies Endowed Scholarship
Wilson W. Sorensen Endowed Scholarship



In September, UVU hosted a 1950s-themed, Drive-in Scholarship Ball.
Pictured: Jeanette Bennett, founder and editor of Utah Valley Magazine

CET Excellence Awards

Teaching Excellence Award



Carolyn Kuehne,
Technology Management

Staff Excellence Award



Katreena Davis,
Transportation Technologies

Teaching Excellence Award



David Heldenbrand,
Computer Science

Service Excellence Award



Meghan Roddy,
Culinary Arts

Scholar Excellence Award



Jingpeng (JP) Tang,
Computer Science

Part-Time Staff Excellence Award



Heather Harris,
Computer Science

New Employees 2020

Architecture & Engineering Design

Jennifer Remy Lecturer
Paul McMullin Lecturer

Computer Science

Brian Knaeble Associate Professor
Larry Zeng Associate Professor
Sayeed Sajal Assistant Professor
Peter Aldous Assistant Professor
Gregory Mortensen Lecturer
Barbara Shirley Advisor

Digital Media

Jennifer Mackenzie Assistant Professor
Bryan Sansom Assistant Professor
Alex Nibley Assistant Professor
Sehrash Khan Advisor
Kim Shaw Administrative Support
Kelly Johnson Administrative Support

Engineering Technology

John Hawker Lecturer
Chris Miles Lecturer
Kyle Sheetz Lab Manager
Brittany Bunker Administrative Support

Engineering

Khaled Shaaban Associate Professor
Waseem Sheikh Associate Professor
Isard Jaafar Assistant Professor
Kalehiwot Manahiloh Assistant Professor
Mark Nardin Assistant Professor
Matthew Ballard Assistant Professor
Mohammad Shekaramiz Assistant Professor
Brett Stone Lecturer
Mohamed Shwani Lecturer
Emily Demke Administrative Support

Information Systems & Technology

Mohamed Lotfy Associate Professor
Jessica Yakiwchuk Advisor

Dean's Office

Emily Smith Administrative Support
Todd Palmer Finance & Operations
Megan Stanley STEM Coordinator & Recruiter
Rachael Freeman Marketing & Communications
Heather Mohn Administrative Support

New Employee Spotlight



Jennifer Mackenzie, Ph.D., Digital Cinema Production

Jenny Mackenzie, Ph.D., is an Emmy-winning documentary filmmaker whose mission is to produce films that promote social change. Her films include “Kick Like a Girl,” “Where’s Herbie?,” “Sugar Babies,” “Lead With Love & Dying in Vein,” “The Opiate Generation,” and the 2018 Sundance Film “Quiet Heroes.”

Her films have aired on top broadcast and VOD channels such as HBO, HULU, PBS, and Amazon Prime, and have received praise in The New York Times, The Washington Post, and The Boston Globe.



Emily Smith, Administrative Assistant to the Dean

Emily Smith spent most of her childhood in Indiana, but moved around a lot as she is an Air Force ‘brat.’ She moved to Utah 25 years ago when she attended BYU. There she earned her bachelor and master’s degrees in music education. She also received an educational leadership license from SUU.

Prior to coming to UVU, she taught junior high and high school band for 17 years. She also spent some time working with a music education company in Salt Lake City. A fun fact about Emily is that she started college as a math major and never lost her love for the subject. She also grew up performing in a circus!



Computer Science Students Win 2nd Place at T3 Competition

A team of two Computer Science students and two personal finance planning students competed in the Technology Tools for Today (T3) competition earlier this year. Each team was assigned a financial technology company to build creative new functionality on its platform. This is a cross-discipline competition led

by Dr. Rachel Bi from personal finance planning, and Dr. Jingpeng Tang from Computer Science. This is our third year working with Orion Advisor Technology. This year we finished in second place.

Computer Science Department Chair, Neil Harrison and Logan Lawrence, master's degree recipient.

More Good News

UVU College of ENGINEERING & TECHNOLOGY
UTAH VALLEY UNIVERSITY

Engineering Student Awarded Engaged Learning Scholarship

The UVU Board of Trustees awarded the *Engaged Learning Scholarship* to mechanical engineering senior, Chandler Flinders. He earned the prestigious scholarship for his work on the Baja all-wheel drive project, along with his faculty advisor, Dr. Matt Jensen. The project received \$6,000 in funding, which will go towards research and production costs.

"I view this as rare opportunity, to simultaneously have access to the resources in the UVU Mechanical Engineering program and funds with which to materialize what would otherwise be just an idea in my head," Flinders said.

Cybersecurity Students Win Third Place at Rocky Mountain Collegiate Cyber Defense Competition

In March, a team of cybersecurity students competed in the 2020 Rocky Mountain Collegiate Cyber Defense Competition and won third place. The competition was held in Colorado this year. Our team included McKay Butterfield, Anthony Long, Dallen Bishop, Daniel Dayley, Makella Child, Alex Reyneke, Ryan Fisk, and Daria Marochnik – all students in our cybersecurity program.

The competition aims to test each team on their cybersecurity skills and knowledge, and provides a unique opportunity for students to network with industry professionals.

Technology Management Professor Publishes New "Anti-Doping" Study

Technology Management Professor Pauli Alin published an article in the *International Journal for Educational Integrity* entitled "Detecting and prosecuting contract cheating with evidence – a Doping Test." The accepted research article is about how to identify students who purchase homework assignments online and submit them as their own. This issue – called contract cheating

in academic literature – is a problem globally. Alin developed a method to collect evidence from students with which he could prove contract cheating. He calls the process the "doping test" method as it mimics some aspects of doping testing in professional sports.

Transportation Technologies Qualifies as the Only University Team at the National Champcar Endurance Series

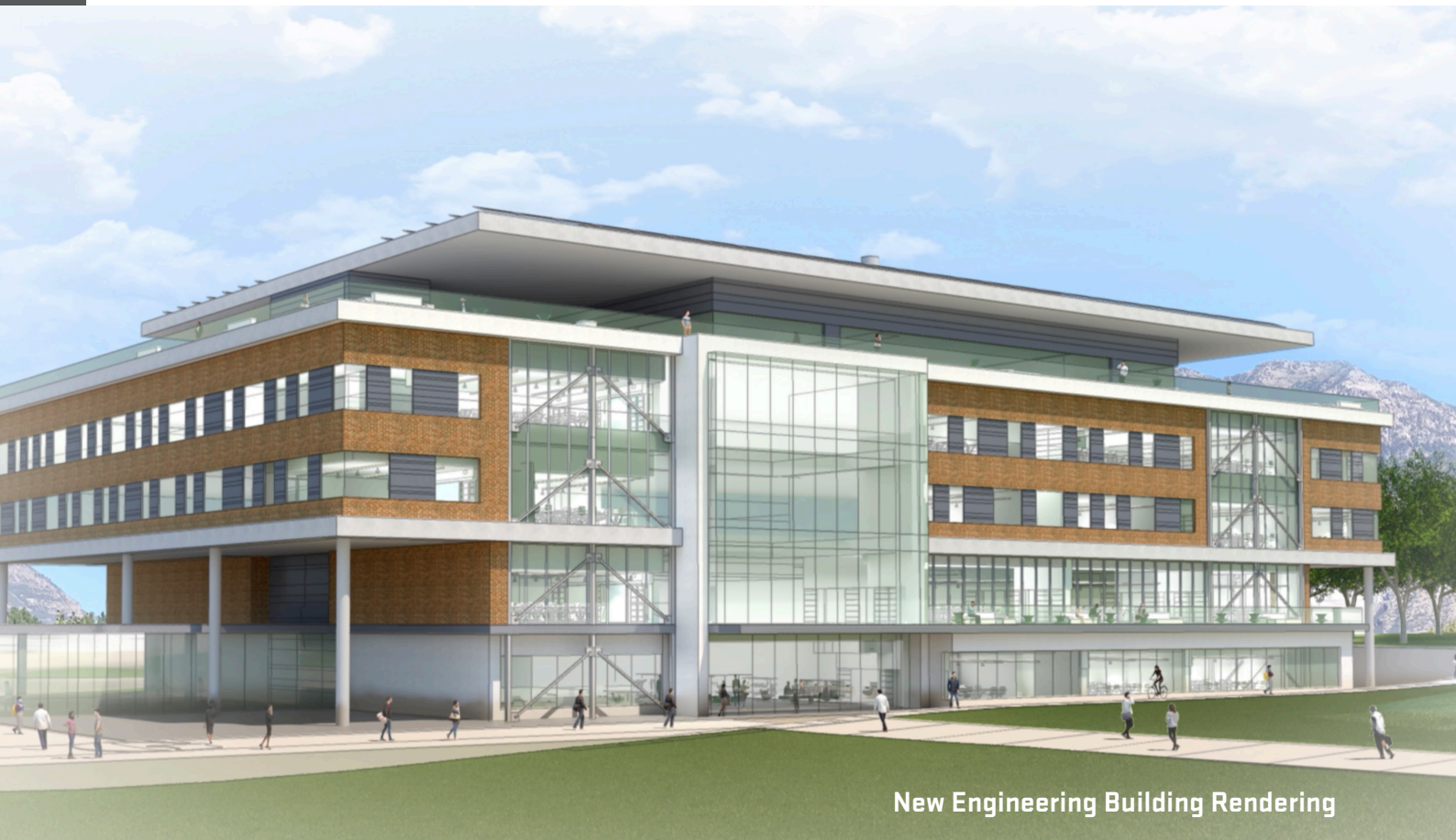
The Wolverine race team qualified for the 2020 Champcar Endurance Series National Championship in Sonoma – the only university in the nation to qualify. Qualifying for the race is a significant achievement. Our race team placed first at their qualifying race in Tooele, Utah and is the only University team to ever place first at the race.

The team prepared diligently for nationals, but had to rebuild parts of the engine that were damaged on the first day of racing. Despite these setbacks, the team still went on to finish in second place at the national championship race in Sonoma, beating many professional teams. They placed 7th overall in 2020.

Culinary Arts Institute Raises \$25K in Online Gala Auction

Given the onset of COVID-19, our Culinary Arts Institute was faced with the challenge of moving its annual Culinary Arts Gala online. In a typical year, the Culinary Arts Institute raises almost \$90,000 to fund the program and its numerous student scholarships. This year, the Culinary Arts Institute hosted an online gala in the form of an auction. Interested parties bid on

personalized meals and dinner events hosted privately by the chefs in our program. Despite the challenges of going virtual for the event, we were able to raise \$25,000 through the online gala. The proceeds will continue to support our award-winning Culinary Arts program and provide scholarships for students.



New Engineering Building Rendering

Engineering Our Future Together

Moving Forward to Meet the Demand

The number of high-tech companies in Utah has more than tripled since 2000, growing from 1,500 to more than 5,000, according to the Salt Lake Tribune. As a result, the demand for engineers and computer scientists along the Wasatch Front has tripled in the last 10 years. UVU is acting quickly to address that need.

In 2017 the UVU Board of Trustees made the historic decision to approve three new engineering degrees – civil, electrical, and mechanical. This momentous expansion is helping to meet the staggering need for homegrown engineering and technology graduates. Given that nearly 90% of students who graduate from CET stay in the area to work, raise families, and

contribute to the local economy, CET is uniquely positioned to educate the talent our community needs to prosper in the challenging times ahead.

The addition of these engineering programs has created an extraordinary opportunity for CET, but it has also created a challenge. Since 2001, UVU’s engineering and technology programs have been housed primarily in the Computer Science Building. Although equipped for basic learning and research, the building cannot accommodate the challenges of new technology and the anticipated increase in the number of students.



Scan the QR Code to see our proposed engineering building design

Setting a New Course to Meet Tomorrow’s Challenges

For the College of Engineering and Technology to prepare its students to enter the professional world as knowledgeable contributors to the fields of engineering and technology and as bold, innovative leaders, we invite your help with the following two strategic goals.

GOAL ONE: Meet the demand for more engineers

A new engineering building will enable CET to provide our community with more locally educated engineers and technologists. It will also allow the college to upgrade its technical infrastructure to align with ever-changing technologies and industries, while taking advantage of emerging technologies and pedagogies.

GOAL TWO: Support student success

Our goal is to help alleviate students’ onerous economic burden by garnering philanthropic support for scholarships and other expenses that will help bridge gaps in personal financial capabilities and government subsidies. With your help, students will be able to complete their education while enjoying important work-study opportunities and other professional development experiences.

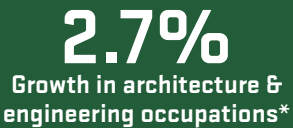
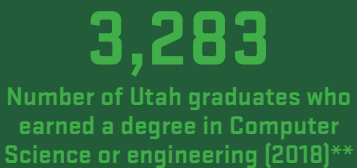
Make a Gift

We extend an invitation to each of you to consider how you might contribute to this next generation of engineers. We invite you to consider making a gift that will go directly to the new building fund. Any amount is greatly appreciated and will go a long way toward achieving our goal and making a new engineering building a reality.

To make a gift, please visit our website, uvu.edu/cet/donate.

For more information or to make an inquiry, please email us at CET_TODAY@UVU.EDU.

GROWING DEMAND



*Source: State of Utah Department of Workforce Services occupational projections (2018-2028)

**Source: Utah System of Higher Education (2018)



If you are a CET alum, we love to hear from you. Please contact us at CET_TODAY@UVU.EDU with stories you would like to share.

UVU.EDU/CET

FOR MORE INFORMATION, CONTACT THE DEAN'S OFFICE AT (801) 863-8321.